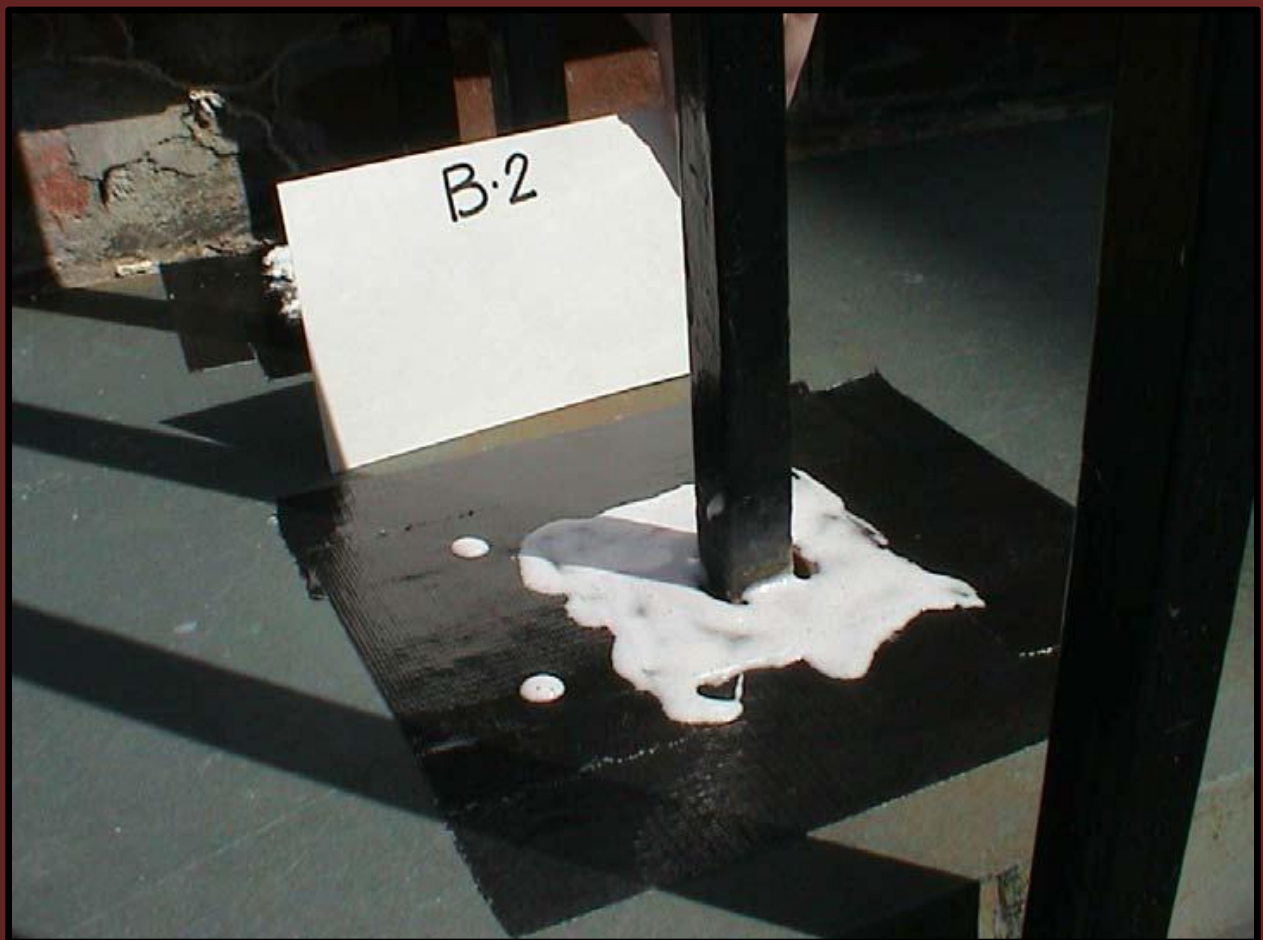


# Field Study Photographs for Historic Preservation

Volume 2  
Chemical Cleaners for Architectural Materials,  
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CHEMICAL CLEANERS

Architectural Conservation (IAR 548) Laboratory Experiments

Under the Direction of

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**CAUTION:** Follow the appropriate safety protocols when handling caustic and/or toxic chemicals.



Figure 1. A paste of rottenstone and mineral oil is prepared for removing the patina from copper. A paste of whiting, or talc, and (diluted) ammonia is prepared for removing the patina from copper. Duct tape (or gaffer's tape) is used to prepare a test area on a copper gutter pipe. Two solutions will be tested on this copper pipe. The upper test area (A-1) will be treated with a mixture of rottenstone and mineral oil. The lower test area (A-2) will be treated with a paste of whiting, or talc, and (diluted) ammonia.





Figure 2. This photograph includes a card identifying the test area and treatment.



Figure 3. After dampening test area A-1 with a wet sponge, the rottenstone and mineral spirits mixture is applied to the copper pipe.



Figure 4. The rottenstone and mineral spirits solution is rubbed into the surface of the copper.



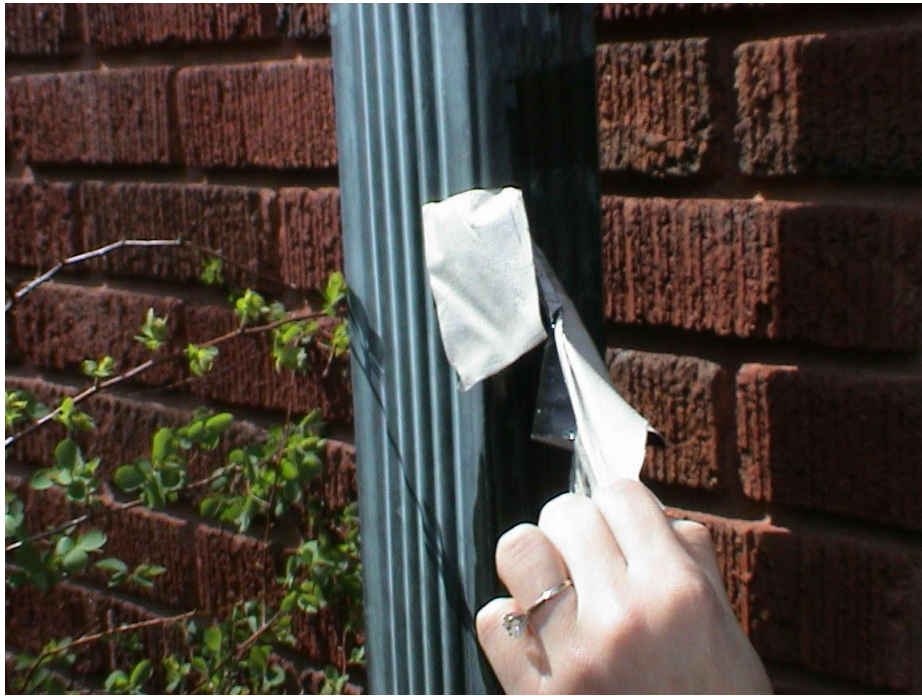


Figure 5. After the solution of rottenstone and mineral spirits has been wiped from the surface of test area A-1, the tape is removed.



Figure 6. Test area A-1 is thoroughly rinsed, and then sponged dry.



Figure 7. Some of the patina on test area A-1 appears to have been removed by the rottenstone and mineral spirits solution.



Figure 8. This photograph shows test area A-1 after the surface has completely dried.





Figure 9. Test area A-2 is located on the lower section of the same copper pipe.



Figure 10. A paste of whiting, or talc, and (diluted) ammonia is applied to test area A-2.





Figure 11. After the paste has been allowed to remain on test area A-2 for a few minutes, it is removed with a wet sponge.

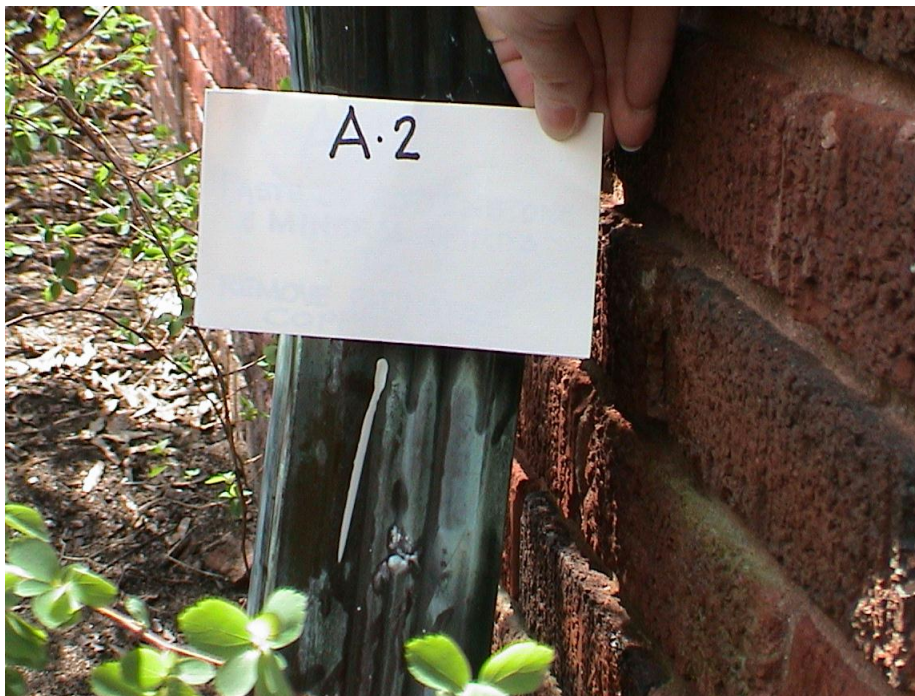


Figure 12. The tape on test area is removed, and the surface is allowed to dry.



Figure 13. Rust from this iron railing has stained this stone step (note the square from a previous test that was conducted on this stone).



Figure 14. Tape is placed around the first rail to create a new test area.



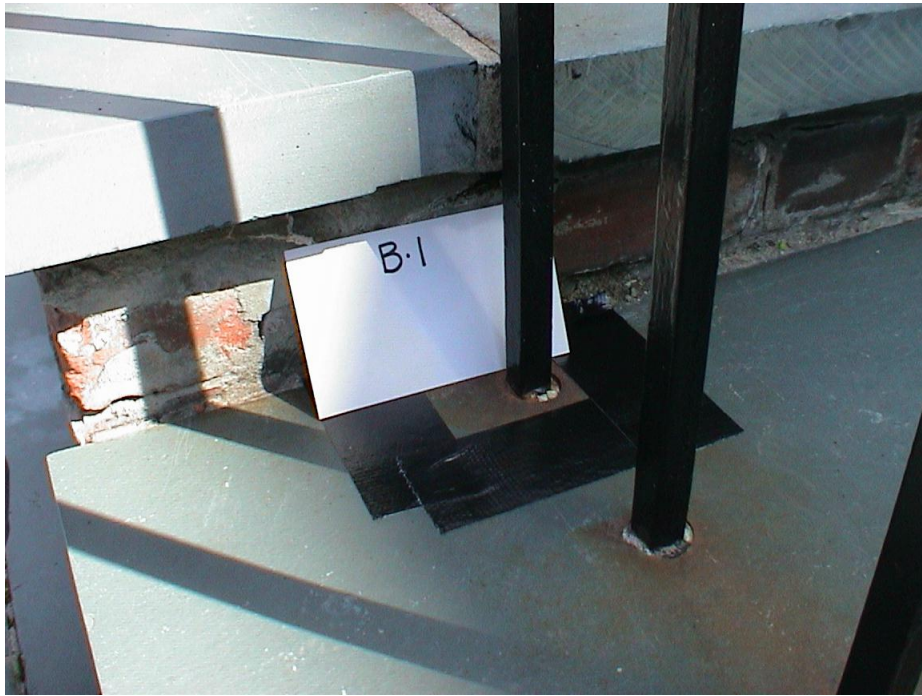


Figure 15. This test area is labeled B-1.



Figure 16. The active substance in the poultice that will be applied to test area B-1 is oxalic acid.





Figure 17. The oxalic acid and talc poultice is applied to test area B-1. Talc, an inert substance, and water are added to the oxalic acid to create a paste that will adhere to the stone surface of test area B-1.



Figure 18. The oxalic acid and talc poultice on test area B-1 is left for one hour.



Figure 19. A second area is taped out on the same step.



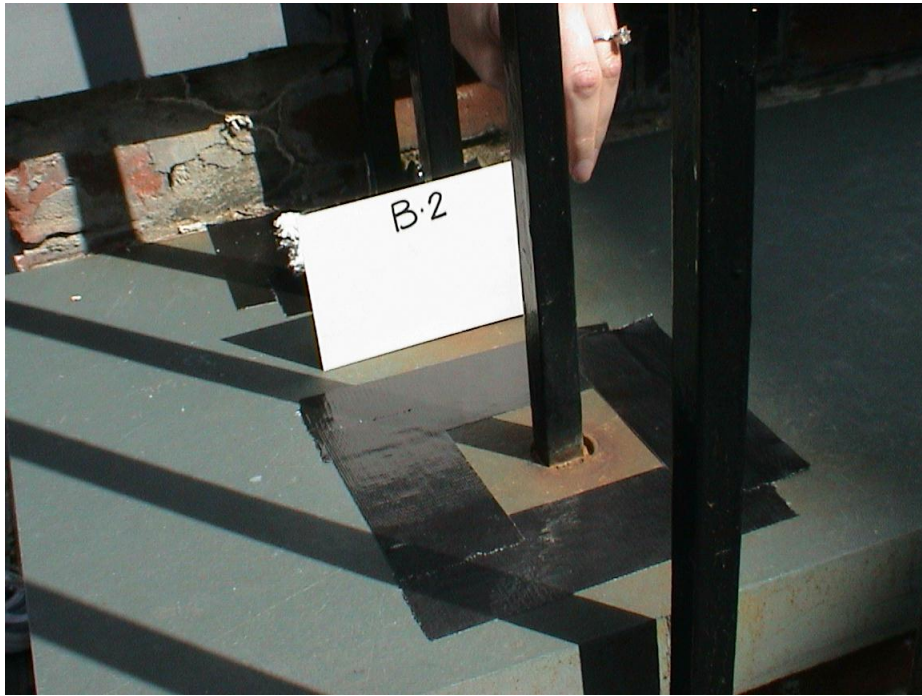


Figure 20. This test area is labeled B-2.

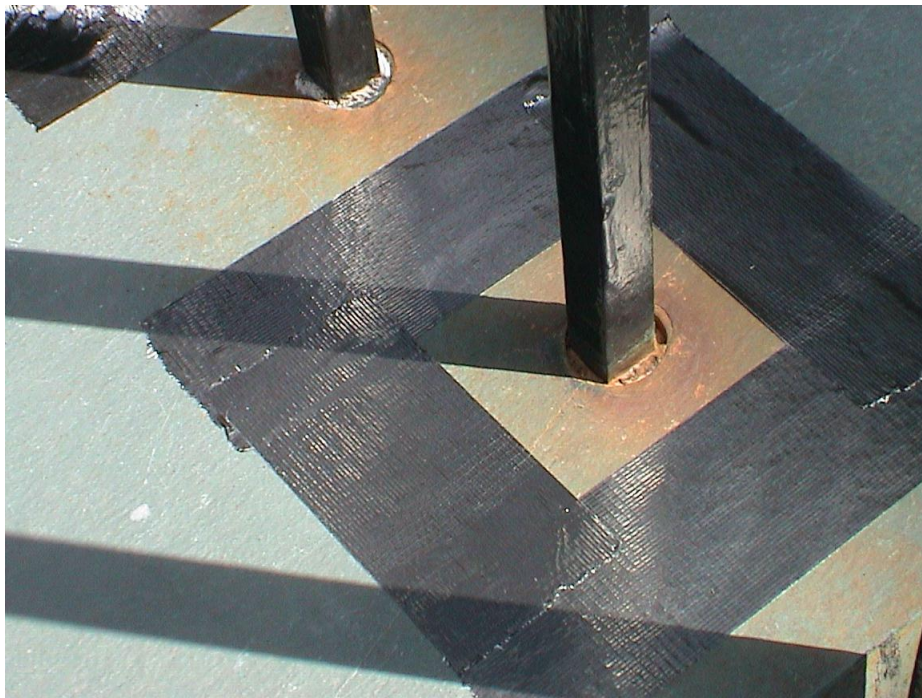


Figure 21. This is a close up of test area B-2.

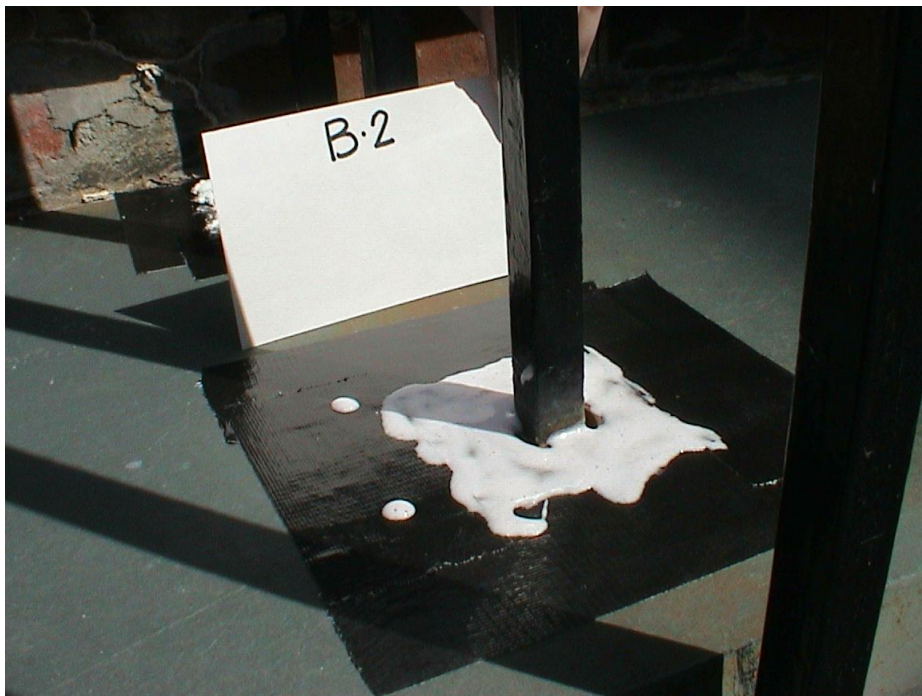


Figure 22. A poultice of orthophosphoric acid (naval jelly) and talc is prepared for application to test area B-2. The poultice of orthophosphoric acid and talc is applied to test area B-2. It will be left for one hour.





Figure 23. After an hour has past, then poultices are scraped off of test area B-1 and test area B-2. The surface is the thoroughly rinsed.



Figure 24. The tape on test area B-2 is removed.



Figure 25. This is a photograph of test area B-1 after the surface has dried.



Figure 26. The oxalic acid and talc poultice removed some of the rust stains on test area B-1.





Figure 27. This is a photograph of test area B-2 after the surface has dried.

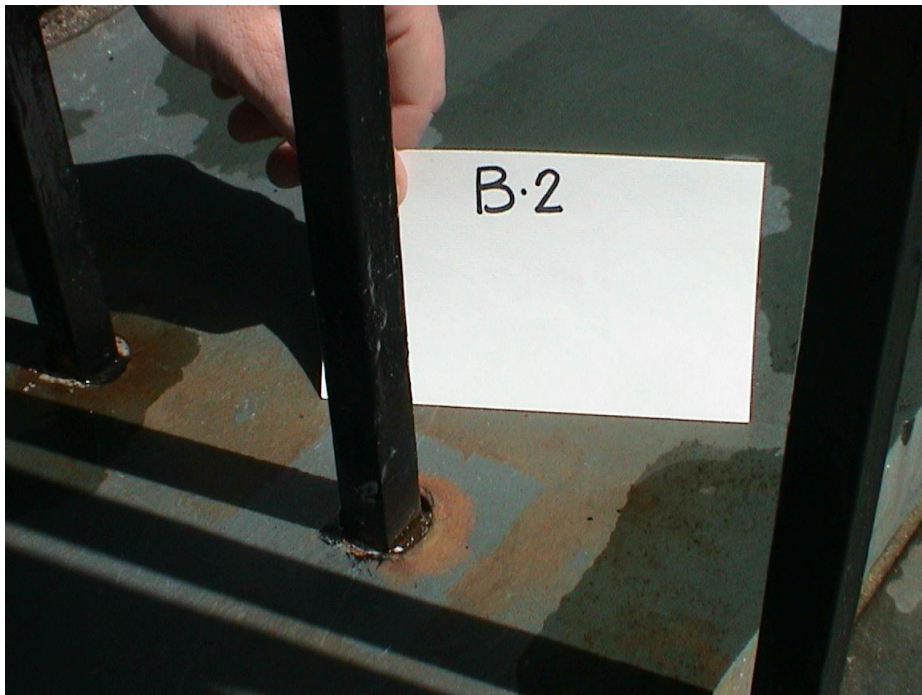


Figure 28. The orthophosphoric acid and talc poultice removed some of the rust stains on test area B-2.

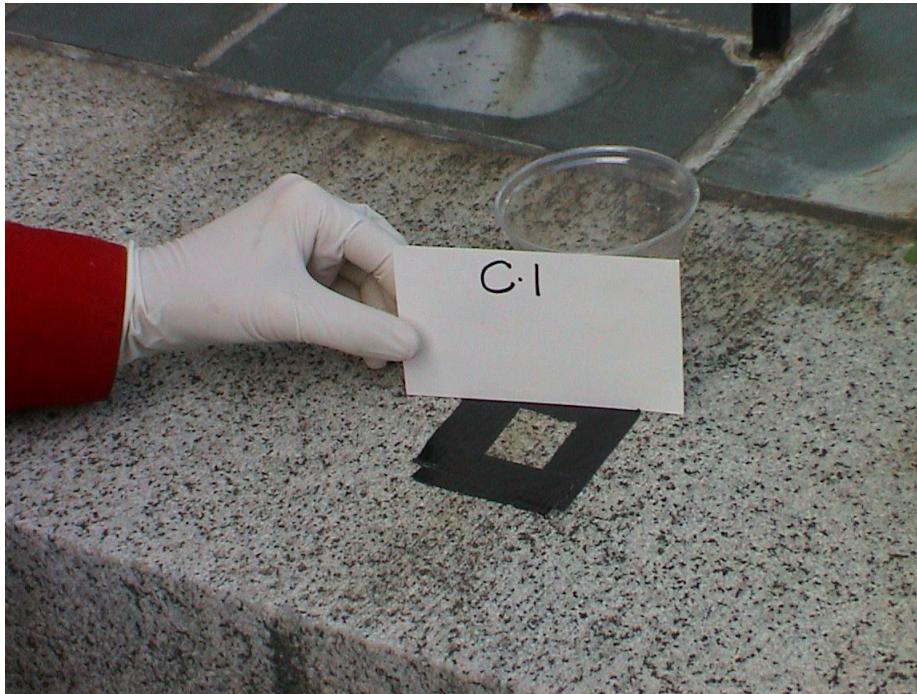


Figure 29. Tape is placed on a granite surface create a new test area labeled C-1.



Figure 30. A solution of hydrofluoric acid and water is prepared for test area C-1.





Figure 31. The hydrofluoric acid and water solution is brushed into the surface of test area C-1.

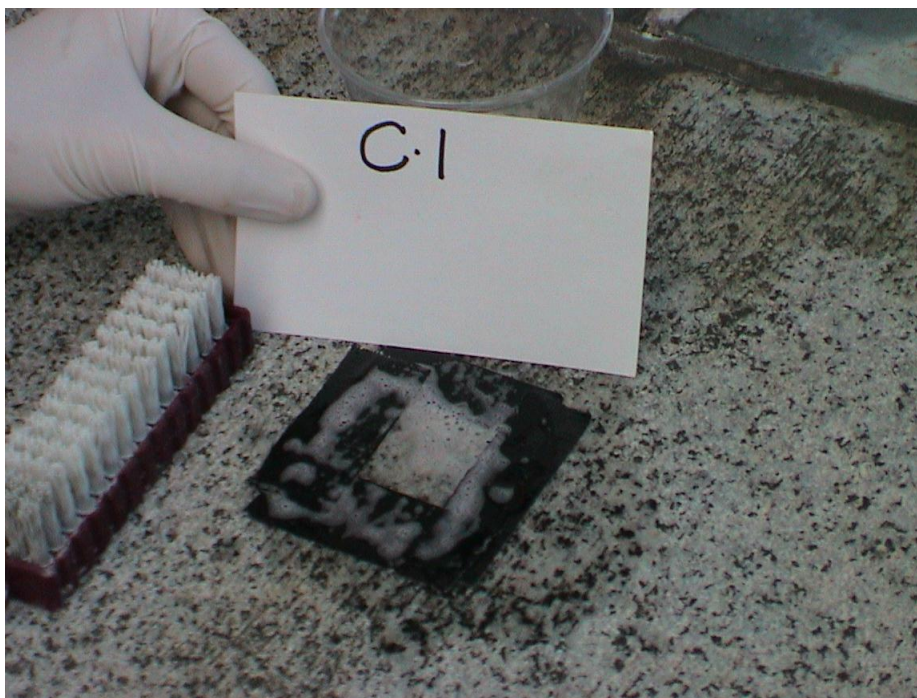


Figure 32. After applying the hydrofluoric acid and water solution, it is given time to clean the surface of the granite.





Figure 33. This photograph shows test area C-1 after the hydrofluoric acid and water solution was rinsed away, and the surface left to dry.

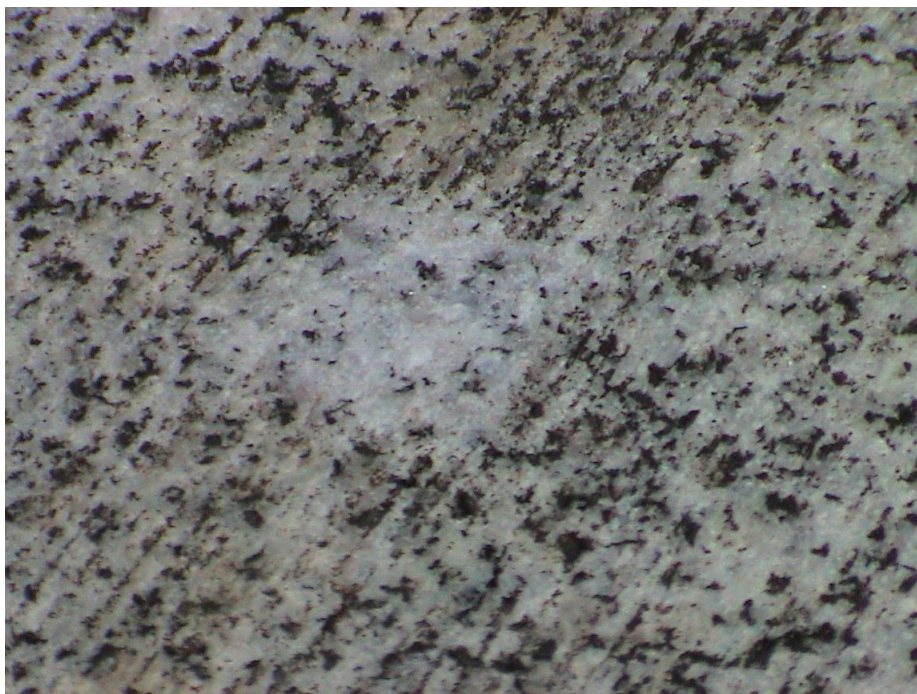


Figure 34. This is a close-up of test area C-1 after cleaning.



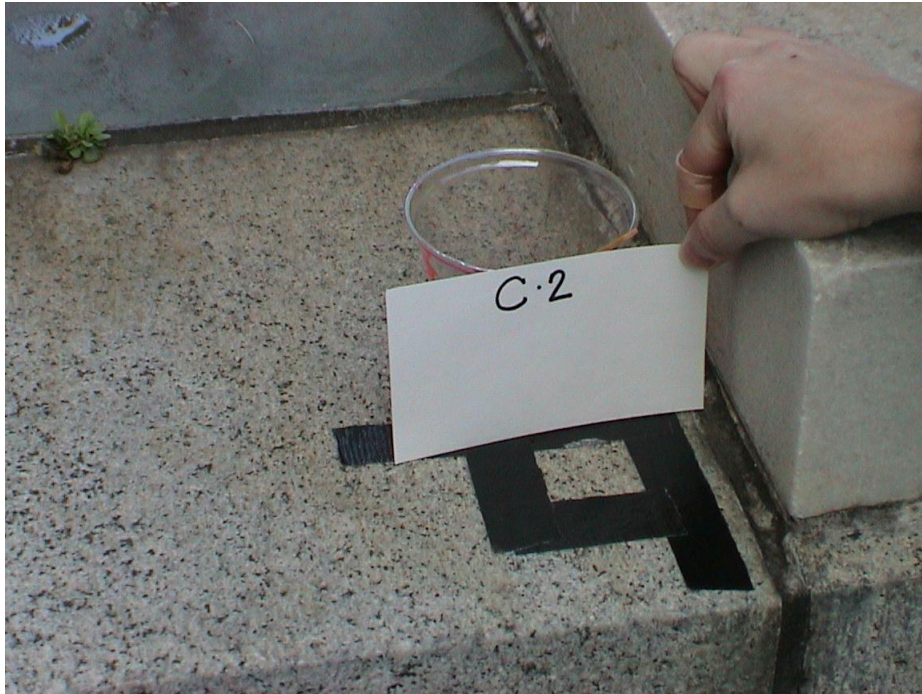


Figure 35. Tape is placed on a granite surface. The new test area labeled C-2.



Figure 36. An orthophosphoric acid poultice is prepared for the test.



Figure 37. The orthophosphoric acid poultice is applied to test area C-2 with a wooden applicator.



Figure 38. The orthophosphoric acid poultice is left for a few minutes to act on the granite surface.



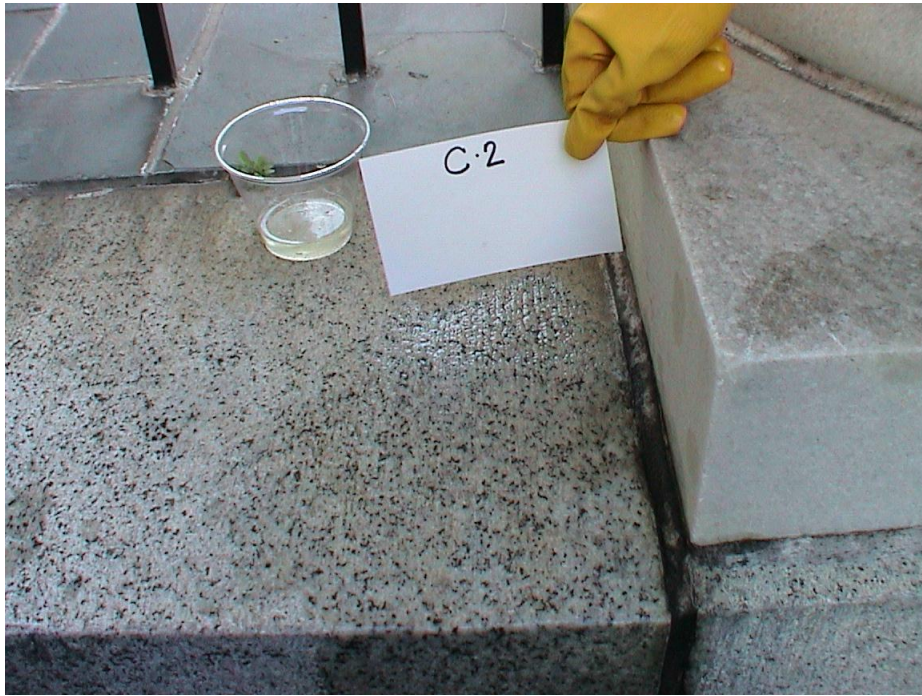


Figure 39. Remove the tape after the orthophosphoric acid is thoroughly rinsed off with water.



Figure 40. This is test area C-2 after the water has dried.

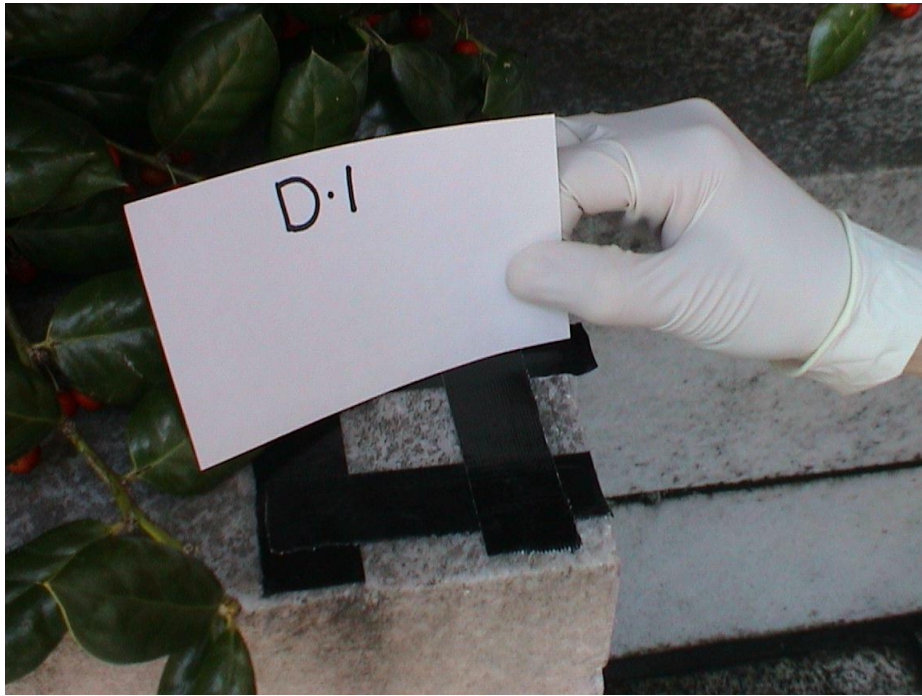


Figure 41. Test area D-1 is on a marble surface.



Figure 42. A solution of sodium hydroxide (lye) and water is prepared for use on test area D-1.





Figure 43. The sodium hydroxide solution will remove fungal stains on the marble that Results from having the holly bush shading the stone's surface.



Figure 44. The sodium hydroxide solution is brushed onto the surface of test area D-1.



Figure 45. The sodium hydroxide solution is left to act upon the fungal stain on test area D-1.



Figure 46. The sodium hydroxide solution is removed with water.





Figure 47. The fungal stain on the surface of test area D-1 was removed by the sodium hydroxide solution.



Figure 48. This is a close-up of test area D-1 after treatment with sodium hydroxide Solution.



Figure 49. Another test area D-2 is set up on the marble surface near D-1.



Figure 50. A poultice can be prepared from diluted ammonia or hydrogen peroxide for use on marble surfaces. One team in the class is considering making their poultice with ammonia. This researcher, however, prepares a poultice of hydrogen peroxide and talc.





Figure 51. The hydrogen peroxide and talc poultice is applied to test area D-2.

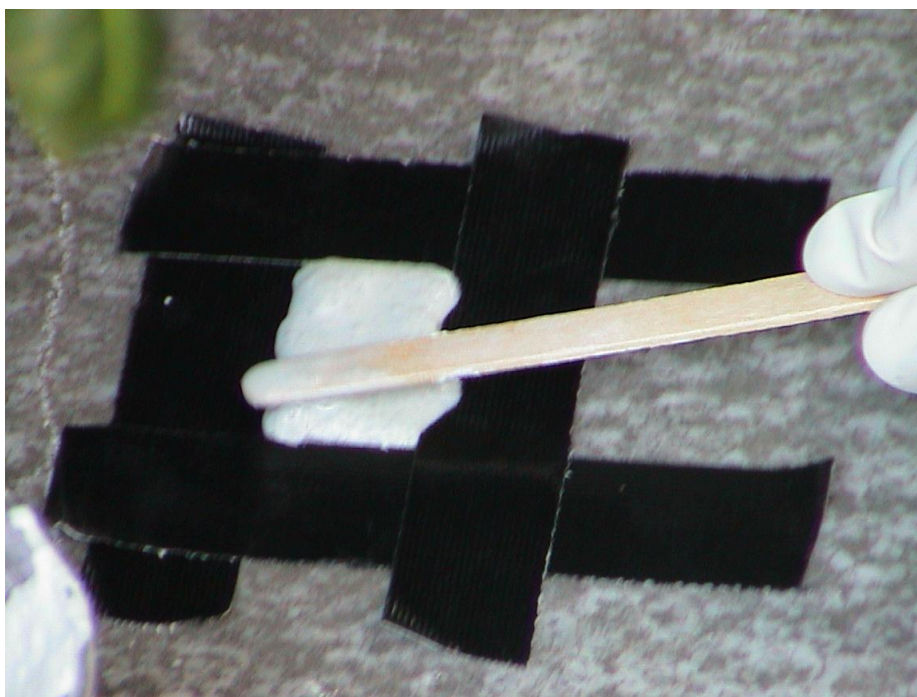


Figure 52. A wooden applicator is used to spread the hydrogen peroxide and talc poultice evenly on test area D-2.

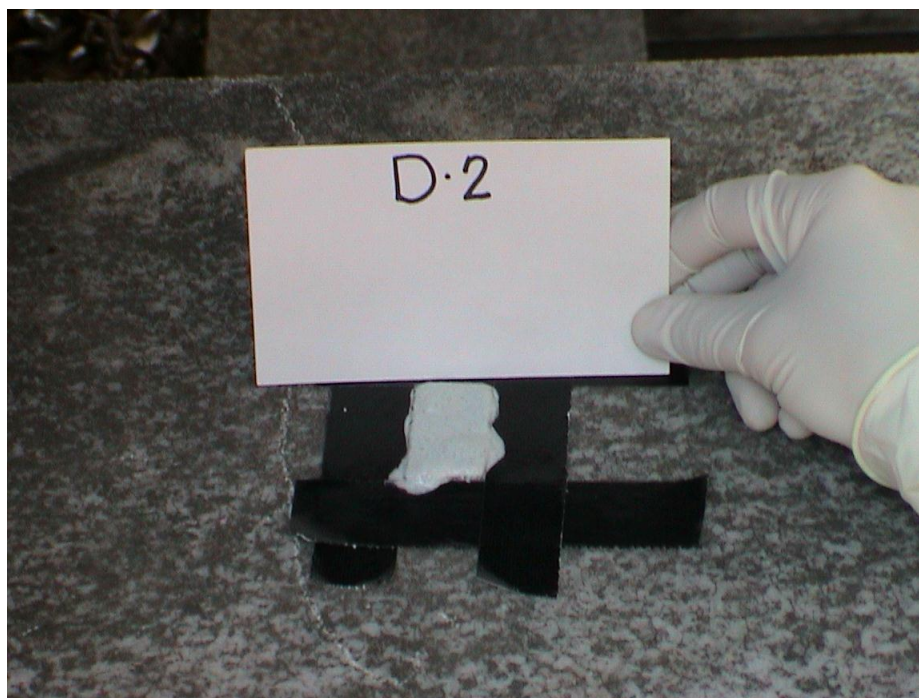


Figure 53. The hydrogen peroxide and talc poultice is left to act upon the marble surface.

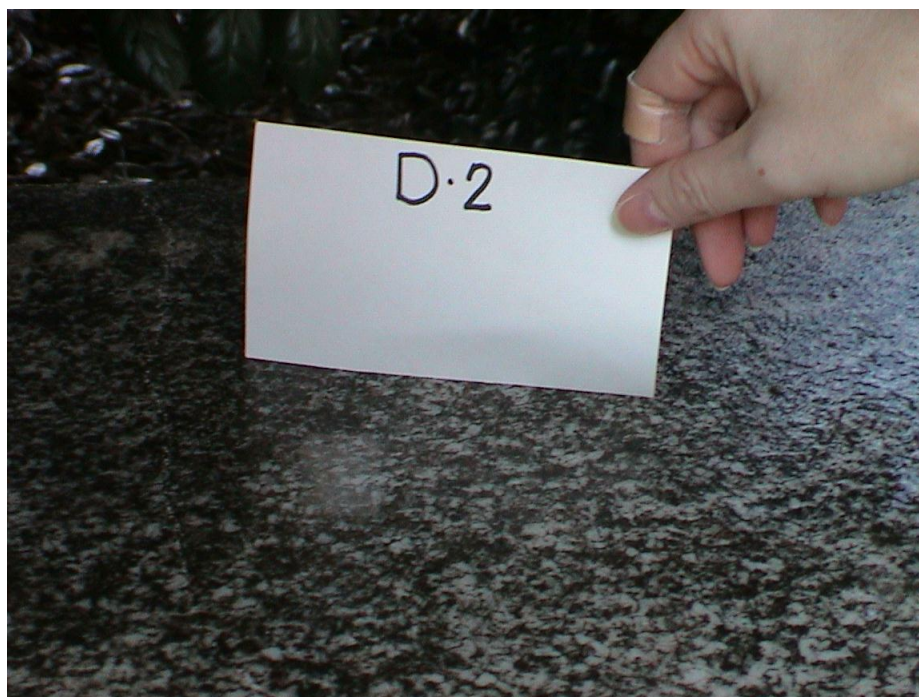


Figure 54. The hydrogen peroxide and talc poultice is washed off the marble surface after 20 minutes.



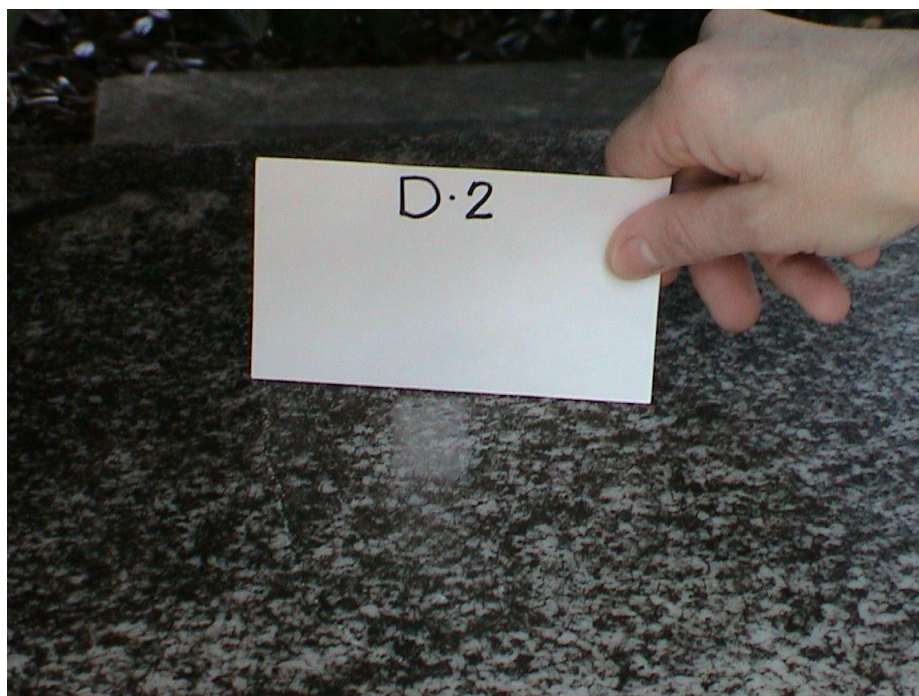


Figure 55. This is a photograph of a test area D-2 after being allowed to dry.

